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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,044	01/07/2002	Man Mohan Rai	ARC-14586-1	4600

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NASA AMES RESEARCH CENTER
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EXAMINER

HIRL, JOSEPH P

ART UNIT	PAPER NUMBER
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2121

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/043,044

Applicant(s)

RAI, MAN MOHAN

Examiner

Joseph P. Hirl

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 8-13 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.5.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date 6.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-13 are pending in this application.
2. The claims and only the claims form the metes and bounds of the invention.
"Office personnel are to give the claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d, 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, I 45-48; p 2100-9, c 1, I 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense. Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

3. Examiner's Opinion:

Para 2 above applies. The Examiner has full latitude to interpret each claim in the broadest reasonable sense.

Restriction

4. During a telephone conversation with applicant's attorney, Robert M. Padilla on March 24, 2004, a provisional election was made without traverse to prosecute the invention of elected group, claims 1-7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-13 are withdrawn from further consideration by the Examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Drawings

5. The drawings are objected to because of the following:

Fig. 2: insert --Prior Art--.

This objection must be corrected.

Claim Objections

6. Claim 1 is objected to because of the following informalities: While the MPEP does not specifically set forth a requirement, the Examiner considers it appropriate that

elements of a claim follow the tradition of Arabic number (claim number) followed by an alphabet character where claim elements are present. Appropriate correction is required.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 1-7 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The language of the claim raises a question as to whether the claim is directed merely to an abstract idea (calculation) that is not tied to a technological art, environment or machine (embodied in hardware) which would result in a practical application producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make

and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 1-7 are rejected under 35 USC 112, first paragraph because current case law (and accordingly, the MPEP) require such a rejection if a 101 rejection is given because when Applicant has not in fact disclosed the practical application for the invention, as a matter of law there is no way Applicant could have disclosed how to practice the undisclosed practical application. This is how the MPEP puts it:

("The how to use prong of section 112 **incorporates as a matter of law** the requirement of 35U.S.C. 101 that the specification disclose as a matter of fact a practical utility for the invention.... If the application fails as a matter of fact to satisfy 35 U.S.C. 101, then the application also fails as a matter of law to enable one of ordinary skill in the art to use the invention under 35 U.S.C. § 112."); In re Kirk, '376 F.2d 936, 942, 153 USPQ 48, 53 (CCPA 1967) ("Necessarily, compliance with § 112 requires a description of how to use presently useful inventions, **otherwise an applicant would anomalously be required to teach how to use a useless invention.**"). See, MPEP 21107.01 (IV), quoting In re Kirk (emphasis added).

Therefore, claims 1-7 are rejected on this basis.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Suykens et al (IEEE 1057-7122/00, referred to as **Suykens**).

Claim 1

Suykens anticipates (1) providing an NN component, having an input layer and a hidden layer and an input vector space, and providing an SVM component, having a feature vector space (**Suykens**, p 1110 , c 1, l 19-21; Examiner's Note (EN): to one of ordinary skill in the art, NN have an input layer and a hidden layer and SVM's have feature vector space); (2) selecting a group of parameters and combinations of parameters and providing a feature space coordinate, in the feature vector space, for each selected parameter and selected parameter combination in the input space (**Suykens**, p 1109 , c 2, l 26-41; EN: the fact that simply mapping the data into another space can greatly simplify the task has been known for a long while in machine learning; the qualities introduced to describe the data in SVM is known as feature space); (3) providing at least one vector of candidate parameter values for each of the group of parameters in the input space (**Suykens**, p 1110 , c 2, l 1-5); (4) providing initial values for connection weights between the input layer and the hidden layer for the NN component (**Suykens**, p 1110 , c 1, l 19-21; EN: neural networks have connecting weights between the input layer and the hidden layer); (5) computing hidden layer output signals, corresponding to the connection weight values, for each of the parameter value vectors (**Suykens**, p 1110 , c 1, l 19-21; EN: this is generic to a neural network); (6) determining an inner product value of a selected number of at least two feature space coordinates (**Suykens**, p 1110 , c 2, l 1-6); (7) providing a Lagrange functional using the determined inner product values (**Suykens**, p 1110 , c 2, l 35-37); (8) providing at least two constraints, expressed in terms of Lagrange multipliers and

input space data (**Suykens**, p 1111 , c 1, l 1-6); (9) minimizing the Lagrange functional, subject to at least one selected constraint, to obtain Lagrange multiplier values corresponding to the minimized Lagrange functional (**Suykens**, p 1111 , c 1, l 3-6); (10) computing a training error, using the connection weights for the NN component and the Lagrange multiplier values for the SVM component (**Suykens**, p 1111 , c 2, l 23-38); (11) when the computed training error is greater than a selected threshold value, changing at least one of the connection weights and repeating steps (5)(10) (**Suykens**, p 1112 , c 2, l 3-5); and (12) when the computed training error is not greater than the threshold value, interpreting the NN component with the associated connection weights and the SVM component with the associated Lagrange multipliers as a trained NN/SVM system (**Suykens**, p 1112 , c 2, l 3-5; EN: when optimized goals are met, the training is complete).

Claim 2

Suykens anticipates providing an optimization method (**Suykens**, p 1112 , c 2, l 3-5); and using the optimization method in at least one of steps (5) through (12) to minimize said training error and to obtain at least one of said connection weight values and said Lagrange multiplier values (**Suykens**, p 1112 , c 2, l 3-5).

Claim 3

Suykens anticipates determining an optimized design by applying a response surface analysis to said design, using said trained NN/SVM system (**Suykens**, p 1114 , c 1, l 14-16; EN: para 2 above applies; response surface in general is a multivariate optimization problem; generalization provides optimal prediction).

Claim 4

Suykens anticipates providing a selected optimization procedure in determining said optimized design (**Suykens**, p 1112 , c 2, l 3-5).

Claim 5

Suykens anticipates augmenting said inner product value with at least one user-specified inner product value to said SVM component (**Suykens**, p 1110 , c 2, l 1-6; EN: para 2 above applies; data is user specified and from such data, at least one inner product is developed).

Claim 6

Suykens anticipates providing a collection of N data points in an M-dimensional space for said input space, where $M \geq 2$ and $N > 2$, and where each data point is assigned an indicium associated with one of at least first and second mutually exclusive sets (**Suykens**, p 1109 , c 2, l 26-41; EN: classification takes place relative to the hyperplane separation); and applying the method of claim 1 for determination of a separation surface in the M-dimensional space that separates the data points into at least first and second mutually exclusive regions that contain substantially all data points in the first set and in the second set, respectively (**Suykens**, p 1109 , c 2, l 26-41).

Claim 7

Suykens anticipates a visually perceptible view of at least a portion of said separation surface in at least two dimensions (**Suykens**, p 1109 , c 2, l 26-33; EN: while

Mercer's condition does not require it, hyperplane separation does provide visual perception).

Conclusion

13. The prior art of record and not relied upon is considered pertinent to applicant's disclosure.

- Whitman et al, US Pub 2003/0040904
- Hartman et al, US Pub 2003/0078850
- Campanini et al, US Pub 2001/0031076
- Vincent et al, IEEE 0-7695-0619-4/00
- Vapnik, IEEE 1045-9227/99

14. Claims 8-13 are restricted. Claims 1-7 are rejected.

Correspondence Information

Any inquiry concerning this information or related to the subject disclosure should be directed to the Examiner, Joseph P. Hirl, whose telephone number is (703) 305-1668. The Examiner can be reached on Monday – Thursday from 6:00 a.m. to 4:30 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the

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Examiner's supervisor, Anil Khatri can be reached at (703) 305-0282.

Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,
Washington, D. C. 20231;

or faxed to:

(703) 746-7239 (for formal communications intended for entry);

or faxed to:

(703) 746-7290 (for informal or draft communications with notation of
"Proposed" or "Draft" for the desk of the Examiner).

Hand-delivered responses should be brought to:

Receptionist, Crystal Park II
2121 Crystal Drive,
Arlington, Virginia.



Joseph P. Hird

March 29, 2004